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INFORMATION DISCLOSURE STATEMENT BY APPLICANT

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Sheet 1 of 2

Application Number 09/424,487
Filing Date 02/29/00
First Named Inventor Choo
Group Art Unit 1653
Examiner Name Robinson, H.
Attorney Docket Number 019496-006220US

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U.S. PATENT DOCUMENTS

Examiner Initials *	Cite No. ¹	U.S. Patent Document		Name of Patentee or Applicant of Cited Document	Date of Publication of Cited Document MM-DD-YYYY	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear
		Number	Kind Code ² (if known)			
	1	6,013,453		Choo et al.	01-11-2000	
	2	6,007,988		Choo et al.	12-28-1999	
	3	6,001,885		Vega et al.	12-14-1999	
	4	5,972,615		An et al.	10-26-1999	
	5	5,939,538		Leavitt et al.	08-17-1999	
	6	5,916,794		Chandrasegaran	06-29-1999	
	7	5,871,907		Winter et al.	02-16-1999	
	8	5,871,902		Weininger et al.	02-16-1999	
	9	5,869,618		Lippman et al.	02-9-1999	
	10	5,792,640		Chandrasegaran	08-11-1998	
	11	5,789,538		Rebar et al.	08-04-1998	
	12	5,702,914		Evans et al.	12-30-1997	
	13	5,674,738		Abramson et al.	10-07-1997	
	14	5,639,592		Evans et al.	06-17-1997	
	15	5,597,693		Evans et al.	01-28-1997	
	16	5,578,483		Evans et al.	11-26-1996	
	17	5,498,530		Schatz et al.	03-12-1996	
	18	5,487,994		Chandrasegaran	01-30-1996	
	19	5,436,150		Chandrasegaran	07-25-1995	
	20	5,403,484		Ladner et al.	04-04-1995	
	21	5,376,530		De The et al.	12-27-1994	
	22	5,356,802		Chandrasegaran	10-18-1994	
	23	5,350,840		Call et al.	09-27-1994	
	24	5,348,864		Barbacid	09-20-1994	
	25	5,340,739		Stevens et al.	08-23-1994	
	26	5,324,819		Oppermann et al.	06-28-1994	
	27	5,324,818		Nabel et al.	06-28-1994	
	28	5,324,638		Tao et al.	06-28-1994	
	29	5,302,519		Blackwood et al.	04-12-1994	
	30	5,243,041		Fernandez-Pol	09-07-1993	
	31	5,223,409		Ladner et al.	06-29-1993	
	32	5,198,346		Ladner et al.	03-30-1993	

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33	5,096,815	Ladner et al.	03-17-1992
34	5,096,814	Aivasidis et al.	03-17-1992
35	4,990,607	Katagiri et al.	02-05-1991

FOREIGN PATENT DOCUMENTS

Examiner Initials*	Cite No. ¹	Foreign Patent Document			Name of Patentee or Applicant of Cited Document	Date of Publication of Cited Document MM-DD-YYYY	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear	T ⁶
		Office ³	Number ⁴	Kind Code ⁵ (if known)				
	36	PCT	WO 99/48909	A2		09-30-1999		
	37	PCT	WO 99/47656	A2		09-23-1999		
	38	PCT	WO 99/45132	A1		09-10-1999		
	39	PCT	WO 99/42474	A2		08-26-1999		
	40	PCT	WO 99/41371	A1		08-19-1999		
	41	PCT	WO 99/36553	A2		07-22-1999		
	42	PCT	WO 98/54311	A1		12-03-1998		
	43	PCT	WO 98/53060	A1		11-26-1998		
	44	PCT	WO 98/53059	A1		11-26-1998		
Im	45	PCT	WO 98/53058	A1		11-26-1998		
	46	PCT	WO 98/53057	A1		11-26-1998		
	47	PCT	WO 97/27213	A1		07-31-1997		
	48	PCT	WO 97/27212	A1		07-31-1997		
	49	PCT	WO 96/32475	A2		10-17-1996		
	50	PCT	WO 96/20951	A1		07-11-1996		
	51	PCT	WO 96/11267	A1		04-08-1996		
	52	PCT	WO 96/06110	A1		02-29-1996		
	53	PCT	WO 95/19431	A1		07-25-1995		
	54	EP	875 567	A2		11-04-1998		

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First Nam d Invent r	Choo
Group Art Unit	1653
Examiner Name	Robinson, H.
Attorney Docket Number	019496-006220US

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Examiner Initials *	Cite No. ¹	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published.	T ²
	55	AGARWAL et al., "Stimulation of Transcript Elongation Requires both the Zinc Finger and RNA Polymerase II Binding Domains of Human TFIIS," <u>Biochemistry</u> , 30(31):7842-7851 (1991).	
	56	ANATO et al., "A thermodynamic study of unusually stable RNA and DNA hairpins," <u>Nuc. Acids. Res.</u> , 19(21):5901-5905 (1991).	
	57	BARBAS, C. F., "Recent advances in phage display," <u>Curr. Opin. Biotech.</u> , 4:526-530 (1993).	
	58	BARBAS et al., "Assembly of combinatorial antibody libraries on phage surfaces: The gene III site," <u>PNAS</u> , 88:7978-7982 (1991).	
	59	BARBAS et al., "Semisynthetic combinatorial antibody libraries: A chemical solution to the diversity problem," <u>PNAS</u> , 89:4457-4461 (1992).	
	60	BELLEFROID et al., "Clustered organization of homologous KRAB zinc-finger genes with enhanced expression in human T lymphoid cells," <u>EMBO J.</u> , 12(4):1363-1374 (1993).	
	61	BERG, J. M., "DNA Binding Specificity of Steroid Receptors," <u>Cell</u> , 57:1065-1068 (1989).	
	62	BERG, J. M., "Sp1 and the subfamily of zinc finger proteins with guanine-rich binding sites," <u>PNAS</u> , 89:11109-11110 (1992).	
	63	BERG et al., "The Galvanization of Biology: A Growing Appreciation for the Roles of Zinc," <u>Science</u> , 271:1081-1085 (1996).	
	64	BERG, J. M., "Letting your fingers do the walking," <u>Nature Biotechnology</u> , 15:323 (1997)	
	65	BERGQVIST et al., "Loss of DNA-binding and new transcriptional <i>trans</i> -activation function in polyomavirus large T-antigen with mutation of zinc finger motif," <u>Nuc. Acids Res.</u> , 18(9):2715-2720 (1990).	
	66	BLAESE et al., "Vectors in cancer therapy: how will they deliver?," <u>Cancer Gene Therapy</u> , 2(4):291-297 (1995).	
	67	CAPONIGRO et al., "Transdominant genetice analysis of a growth control pathway," <u>PNAS</u> , 95:7508-7513 (1998)	
	68	CELENZA et al., "A Yeast Gene That Is Essential for Release from Glucose Repression Encodes a Protein Kinase," <u>Science</u> , 233:1175-1180 (1986).	
	69	CHENG et al., "Identification of Potential Target Genes for Adr1p through Characterization of Essential Nucleotides in UAS1," <u>Mol. Cellular Biol.</u> , 14(6):3842-3852 (1994).	
	70	CHENG et al., "A Single Amino Acid substitution in Zinc Finger 2 of Adr1p Changes its Binding Specificity at two Positions in UAS1," <u>J. Mol. Biol.</u> , 251:1-8 (1995)	
	71	CHOO et al., "A role in DNA binding for the linker sequences of the first three zinc fingers of TFIIIA," <u>Nuc. Acids Res.</u> , 21(15):3341-3346 (1993).	
	72	CHOO et al., "Designing DNA-binding proteins on the surface of filamentous phage," <u>Curr. Opin. Biotech.</u> , 6:431-436 (1995).	

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73	CHOO et al., "Promoter-specific Activation of Gene Expression Directed by Bacteriophage-selected Zinc Fingers," <i>J. Mol. Biol.</i> , 273:525-532 (1997).
74	CHOO, Y., "Recognition of DNA methylation by zinc fingers," <i>Nature Struct. Biol.</i> , 5(4):264-265 (1998).
75	CHOO et al., "All wrapped up," <i>Nature Structural Biology</i> , 5(4):253-255 (1998).
76	CHOO, Y., "End effects in DNA recognition by zinc finger arrays," <i>Nuc. Acids Res.</i> , 26(2):554-557 (1998).
77	CHOO et al., "In vivo repression by a site-specific DNA-binding protein designed against an oncogenic sequence," <i>Nature</i> , 372:642-645 (1994).
78	CHOO et al., "Physical basis of a protein-DNA recognition code," <i>Curr. Opin. Struct. Biol.</i> , 7(1):117-125 (1997).
79	CHOO et al., "Toward a code for the interactions of zinc fingers with DNA: Selection of randomized fingers displayed on phage," <i>PNAS</i> , 91:11163-11167 (1994).
80	CHOO et al., "Selection of DNA binding sites for zinc fingers using rationally randomized DNA reveals coded interactions," <i>PNAS</i> , 91:11168-11172 (1994).
81	CORBI, N. et al., "Synthesis of a New Zinc Finger Peptide; Comparison of its 'Code' Deduced and 'CASTing' Derived Binding Sites," <i>FEBS Letters</i> , 417: 71-74 (1997).
82	CROZATIER et al., "Single Amino Acid Exchanges in Separate Domains of the Drosophila serendipity δ Zinc Finger Protein Cause Embryonic and Sex Biased Lethality," <i>Genetics</i> , 131:905-916 (1992).
83	DEBS et al., "Regulation of Gene Expression <i>in Vivo</i> by Liposome-mediated Delivery of a Purified Transcription Factor*," <i>J. Biological Chemistry</i> , 265(18):10189-10192 (1990).
84	DESJARLAIS et al., "Length-encoded multiplex binding site determination: Application to zinc finger proteins," <i>PNAS</i> , 91:11099-11103 (1994).
85	DESJARLAIS et al., "Use of a zinc-finger consensus sequence framework and specificity rules to design specific DNA binding proteins," <i>PNAS</i> , 90:2256-2260 (1993).
86	DESJARLAIS et al., "Toward rules relating zinc finger protein sequences and DNA binding site preferences," <i>PNAS</i> , 89(16):7345-7349 (1992).
87	DESJARLAIS et al., "Redesigning the DNA-Binding Specificity of a Zinc Finger Protein: A Data Base-Guided Approach," <i>Proteins: Structure, Function, and Genetics</i> , 12(2):101-104 (1992).
88	DESJARLAIS et al., "Redesigning the DNA-Binding Specificity of a Zinc Finger Protein: A Data Base-Guided Approach," <i>Proteins: Structure, Function, and Genetics</i> , 13:272 (1992).
89	DIBELLO et al., "The Drosophila <i>Broad-Complex</i> Encodes a Family of Related Proteins Containing Zinc Fingers," <i>Genetics</i> , 129:385-397 (1991).
90	ELROD-ERICKSON et al., "High-resolution structures of variant Zif268-DNA complexes: implications for understanding zinc finger-DNA recognition," <i>Structure</i> , 6(4):451-464 (1998).
91	ELROD-ERICKSON et al., "Zif268 protein-DNA complex refined at 1.6 Å: a model system for understanding zinc finger-DNA interactions," <i>Structure</i> , 4(10):1171-1180 (1996).
92	FAIRALL et al., "The crystal structure of a two zinc-finger peptide reveals an extension to the rules for zinc-finger/DNA recognition," <i>Nature</i> , 366:483-487 (1993).
93	FRANKEL et al., "Fingering Too Many Proteins," <i>Cell</i> , 53:675 (1988).

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94	FRIESEN et al., "Phage Display of RNA Binding Zinc Fingers from Transcription Factor IIIA*," <u>J. Biological Chem.</u> , 272(17):10994-10997 (1997).
95	GHOSH, D., "A relational database of transcription factors," <u>Nuc. Acids Res.</u> , 18(7):1749-1756 (1990).
96	GOGOS et al., "Recognition of diverse sequences by class I zinc fingers: Asymmetries and indirect effects on specificity in the interaction between CF2II and A+T-rich sequence elements," <u>PNAS</u> , 93(5):2159-2164 (1996)
97	GOSSEN et al., "Tight control of gene expression in mammalian cells by tetracycline-responsive promoters," <u>PNAS</u> , 89:5547-5551 (1992)
98	GREISMAN et al., "A General Strategy for Selecting High-Affinity Zinc Finger Proteins for Diverse DNA Target Sites," <u>Science</u> , 275:657-661 (1997)
99	HAMILTON et al., "High affinity binding sites for the Wilms' tumor suppressor protein WT1," <u>Nuc. Acids Res.</u> , 23(2):277-284 (1995).
100	HAMILTON et al., "Comparison of the DNA Binding Characteristics of the Related Zinc Finger Proteins WT1 and EGR1," <u>Biochemistry</u> , 37:2051-2058 (1998).
101	HANAS et al., "Internal deletion mutants of <i>Xenopus</i> transcription factor IIIA," <u>Nuc. Acids Res.</u> , 17(23):9861-9870 (1989).
102	HAYES et al., "Locations of Contacts between Individual Zinc Fingers of <i>Xenopus laevis</i> Transcription Factor IIIA and the Internal Control Region of a 5S RNA Gene," <u>Biochemistry</u> , 31:11600-11605 (1992).
103	HEINZEL et al., "A complex containing N-CoR, mSin3 and histone deacetylase mediates transcriptional repression," <u>Nature</u> , 387:43-48 (1997).
104	HIRST et al., "Discrimination of DNA response elements for thyroid hormone and estrogen is dependant on dimerization of receptor DNA binding domains," <u>PNAS</u> , 89:5527-5531 (1992).
105	HOFFMAN et al., "Structures of DNA-binding mutant zinc finger domains: Implications for DNA binding," <u>Protein Science</u> , 2:951-965 (1993).
106	ISALAN et al., "Comprehensive DNA Recognition through Concerted Interactions from Adjacent Zinc Fingers," <u>Biochemistry</u> , 37:12026-12033 (1998).
107	JACOBS, G. H., "Determination of the base recognition positions of zinc fingers from sequence analysis," <u>EMBO J.</u> , 11(12):4507-4517 (1992).
108	JAMIESON et al., "A zinc finger directory for high-affinity DNA recognition," <u>PNAS</u> , 93:12834-12839 (1996)
109	JAMIESON et al., "In Vitro Selection of Zinc Fingers with Altered DNA-Binding Specificity," <u>Biochemistry</u> , 33(19):5689-5695 (1994)
110	JULIAN et al., "Replacement of His23 by Cys in a zinc finger of HIV-1 NCp7 led to a change in 1H NMR-derived 3D structure and to a loss of biological activity," <u>FEBS letters</u> , 331(1,2):43-48 (1993).
111	KAMIUCHI et al., "New multi zinc finger protein: biosynthetic design and characteristics of DNA recognition," <u>Nucleic Acids Symposium Series</u> , 37:153-154 (1997).
112	KIM et al., "Serine at Position 2 in the DNA Recognition helix of a Cys2-His2 Zinc finger Peptide is Not, in General, Responsible for Base Recognition," <u>J. Mol. Biol.</u> , 252:1-5 (1995).
113	KIM et al., "Site-specific cleavage of DNA-RNA hybrids by zinc finger/FokI cleavage domain fusions," <u>Gene</u> , 203:43-49 (1997).

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114	KIM et al., "A 2.2 Å resolution crystal structure of a designed zinc finger protein bound to DNA," <u>Nat. Struct. Biol.</u> , 3(11):940-945 (1996)
115	KIM et al., "Getting a handhold on DNA: Design of poly-zinc finger proteins with femtomolar dissociation constants," <u>PNAS</u> , 95:2812-2817 (1998).
116	KIM et al., "Design of TATA box-binding protein/zinc finger fusions for targeted regulation of gene expression," <u>PNAS</u> , 94:3616-3620 (1997)
117	KIM et al., "Hybrid restriction enzymes: Zinc finger fusions to <i>Fok I</i> cleavage domain," <u>PNAS</u> , 93:1156-1160 (1996)
118	KIM et al., "Transcriptional repression by zinc finger peptides," <u>J. Biol. Chem.</u> , 272(47):29795-28000 (1997).
119	KINZLER et al., "The GLI gene is a member of the Kruppel family of zinc finger proteins," <u>Nature</u> , 332:371-4 (1988).
120	KLUG, A., "Gene Regulatory Proteins and Their Interaction with DNA," <u>Ann. NY Acad. Sci.</u> , 758:143-160 (1995).
121	KLUG et al., "Protein Motifs 5: Zinc Fingers," <u>FASEB J.</u> , 9:597-604 (1995).
122	KOTHEKAR, V., "Computer simulation of zinc finger motifs from cellular nucleic acid binding protein and their interaction with consensus DNA sequences," <u>FEBS Letters</u> , 274(1-2):217-222 (1990).
123	KRIWACKI et al., "Sequence-specific recognition of DNA by zinc-finger peptides derived from the transcription factor Sp1," <u>PNAS</u> , 89:9759-9763 (1992).
124	KULDA et al., "The regulatory gene <i>areA</i> mediating nitrogen metabolite repression in <i>Aspergillus nidulans</i> . Mutations affecting specificity of gene activation alter a loop residue of a putative zinc finger," <u>EMBO J.</u> , 9(5):1355-1364 (1990).
125	LIU et al., "Design of polydactyl zinc-finger proteins for unique addressing within complex genomes," <u>PNAS</u> , 94(11):5525-5530 (1997).
126	MANDEL-GUTFREUND et al., "Quantitative parameters for amino acid-base interaction: implications for prediction of protein-DNA binding sites," <u>Nuc. Acids Res.</u> , 26(10):2306-2312 (1998).
127	MARGOLIN et al., "Kruppel-associated boxes are potent transcriptional repression domains," <u>PNAS</u> , 91:4509-4513 (1994).
128	MIZUSHIMA et al., "pEF-BOS, a powerful mammalian expression vector," <u>Nuc. Acids Res.</u> , 18(17):5322 (1990).
129	NAKAGAMA et al., "Sequence and Structural Requirements for High-Affinity DNA Binding by the WT1 Gene Product," <u>Molecular and Cellular Biology</u> , 15(3):1489-1498 (1995).
130	NARDELLI et al., "Zinc finger-DNA recognition: analysis of base specificity by site-directed mutagenesis," <u>Nuc. Acids Res.</u> , 20(16):4137-4144 (1992)
131	NARDELLI et al., "Base sequence discrimination by zinc-finger DNA-binding domains," <u>Nature</u> , 349:175-178 (1991).
132	NEKLUDOVA et al., "Distinctive DNA conformation with enlarged major groove is found in Zn-finger-DNA and other protein-DNA complexes," <u>PNAS</u> , 91:6948-6952 (1994)
133	ORKIN et al., "Report and Recommendations of the Panel to Assess the NIH Investment in Research on Gene Therapy," December 7, 1995.

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Application Number	09/424,487
Filing Date	February 29, 2000
First Named Inventor	Choo
Group Art Unit	1653
Examiner Name	Robinson, H.
Attorney Docket Number	019496-006220US

134	PABO et al., "Systematic Analysis of Possible Hydrogen Bonds between Amino Acid Side Chains and B-form DNA," <i>J. Biomolecular Struct. Dynamics</i> , 1:1039-1049 (1983).
135	PABO et al., "Protein-DNA Recognition," <i>Ann. Rev. Biochem.</i> , 53:293-321 (1984).
136	PABO, C. O., "Transcription Factors: Structural Families and Principals of DNA Recognition," <i>Ann. Rev. Biochem.</i> , 61:1053-1095 (1992).
137	PAVLETICH et al., "Crystal Structure of a Five-Finger GLI-DNA Complex: New Perspectives on Zinc Fingers," <i>Science</i> , 261:1701-1707 (1993).
138	PAVLETICH et al., "Zinc Finger-DNA Recognition: Crystal Structure of a Zif268-DNA Complex at 2.1 Å," <i>Science</i> , 252:809-817 (1991)
139	PENGUE et al., "Repression of transcriptional activity at a distance by the evolutionarily conserved KRAB domain present in a subfamily of zinc finger proteins," <i>Nuc. Acids Res.</i> , 22(15):2908-2914 (1994).
140	PENGUE et al., "Transcriptional Silencing of Human Immunodeficiency Virus Type 1 Long Terminal Repeat-Driven Gene Expression by the Kruppel-Associated Box Repressor Domain Targeted to the Transactivating Response Element," <i>J. Virology</i> , 69(10):6577-6580 (1995).
141	PENGUE et al., "Kruppel-associated box-mediated repression of RNA polymerase II promoters is influenced by the arrangement of basal promoter elements," <i>PNAS</i> , 93:1015-1020 (1996).
142	POMMERANTZ et al., "Structure-Based Design of a Dimeric Zinc Finger Protein," <i>Biochemistry</i> , 37(4):965-970 (1998)
143	POMMERANTZ et al., "Structure-Based Design of Transcription Factors," <i>Science</i> , 267:93-96 (1995).
144	POMMERANTZ et al., "Analysis of homeodomain function by structure-based design of a transcription factor," <i>PNAS</i> , 92:9752-9756 (1995)
145	QIAN et al., "Two-Dimensional NMR Studies of the Zinc Finger Motif: Solution Structures and Dynamics of Mutant ZFY Domains Containing Aromatic Substitutions in the Hydrophobic Core," <i>Biochemistry</i> , 31:7463-7476 (1992).
146	QUIGLEY et al., "Complete Androgen Insensitivity Due to Deletion of Exon C of the Androgen Receptor Gene Highlights the Functional Importance of the Second Zinc Finger of the Androgen Receptor <i>in Vivo</i> ," <i>Molecular Endocrinology</i> , 6(7):1103-1112 (1992).
147	RAUSCHER et al., "Binding of the Wilms' Tumor Locus Zinc Finger Protein to the EGR-1 Consensus Sequence," <i>Science</i> , 250:1259-1262 (1990).
148	RAX et al., "Repressor to activator switch by mutations in the first Zn finger of the glucocorticoid receptor: Is direct DNA binding necessary?," <i>PNAS</i> , 88:7086-7090 (1991).
149	REBAR et al., "Phage Display Methods for Selecting Zinc Finger Proteins with Novel DNA-Binding Specificities," <i>Methods in Enzymology</i> , 267:129-149 (1996).
150	REBAR et al., "Zinc Finger Phage: Affinity Selection of Fingers with New DNA-Binding Specificities," <i>Science</i> , 263:671-673 (1994)
151	REITH et al., "Cloning of the major histocompatibility complex class II promoter binding protein affected in a hereditary defect in class II gene regulation," <i>PNAS</i> , 86:4200-4204 (1989).
152	RHODES et al., "Zinc Fingers: They play a key part in regulating the activity of genes in many species, from yeast to humans. Fewer than 10 years ago no one knew they existed," <i>Scientific American</i> , 268:56-65 (1993)

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Filing Date	February 29, 2000
First Named Inv nt r	Choo
Group Art Unit	1653
Examiner Name	Robinson, H.
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153	RICE et al., "Inhibitors of HIV Nucleocapsid Protein Zinc Fingers as Candidates for the Treatment of AIDS," <u>Science</u> , 270:1194-1197 (1995).
154	RIVERA et al., "A humanized system for pharmacologic control of gene expression," <u>Nature Medicine</u> , 2(9):1028-1032 (1996)
155	ROLLINS et al., "Role of TFIIIA Zinc Fingers In vivo: Analysis of Single-Finger Function in Developing <i>Xenopus</i> Embryos," <u>Molecular Cellular Biology</u> , 13(8):4776-4783 (1993).
156	SALEH et al., "A Novel Zinc Finger Gene on Human Chromosome 1qter That Is Alternatively Spliced in Human Tissues and Cell Lines," <u>Am. J. Hum. Genet.</u> , 52:192-203 (1993).
157	SHI et al., "Specific DNA-RNA Hybrid Binding by Zinc Finger Proteins," <u>Science</u> , 268:282-284 (1995).
158	SHI et al., "DNA Unwinding Induced by Zinc Finger Protein Binding," <u>Biochemistry</u> , 35:3845-3848 (1996)
159	SHI et al., "A direct comparison of the properties of natural and designed finger proteins," <u>Chem. & Biol.</u> , 2(2):83-89 (1995)
160	SINGH et al., "Molecular Cloning of an Enhancer Binding Protein: Isolation by Screening of an Expression Library with a Recognition Site DNA," <u>Cell</u> , 52:415-423 (1988).
161	SKERKA et al., "Coordinate Expression and Distinct DNA-Binding Characteristics of the four EGR-Zinc Finger Proteins in Jukat T Lymphocytes," <u>Immunobiology</u> , 198:179-191 (1997).
162	SOUTH et al., "The Nucleocapsid Protein Isolated from HIV-1 Particles Binds Zinc and Forms Retroviral-Type Zinc Fingers," <u>Biochemistry</u> , 29:7786-7789 (1990).
163	SUZUKI et al., "Stereochemical basis of DNA recognition by Zn fingers," <u>Nuc. Acids Res.</u> , 22(16):3397-3405 (1994)
164	SUZUKI et al. "DNA recognition code of transcription factors in the helix-turn-helix, probe helix, hormone receptor, and zinc finger families," <u>PNAS</u> , 91:12357-12361 (1994)
165	SWIRNOFF et al., "DNA-Binding Specificity of NGFI-A and Related Zinc Finger Transcription Factors," <u>Mol. Cell. Biol.</u> , 15(4):2275-2287 (1995)
166	TAYLOR et al., "Designing Zinc-Finger ADRI Mutants with Altered Specificity of DNA Binding to T in UAS1 Sequences," <u>Biochemistry</u> , 34:3222-3230 (1995)
167	THIESEN et al., "Determination of DNA binding specificities of mutated zinc finger domains," <u>FEBS Letters</u> , 283(1):23-26 (1991).
168	THIESEN et al., "Amino Acid Substitutions in the SP1 Zinc Finger Domain Alter the DNA Binding Affinity to Cognate SP1 Target Site," <u>Biochem. Biophys. Res. Commun.</u> , 175(1):333-338 (1991).
169	THUKRAL et al., "Localization of a Minimal Binding Domain and Activation Regions in Yeast Regulatory Protein ADRI," <u>Molecular Cellular Biology</u> , 9(6):2360-2369 (1989).
170	THUKRAL et al., "Two Monomers of Yeast Transcription Factor ADRI Bind a Palindromic Sequence Symmetrically to Activate <i>ADH2</i> Expression," <u>Molecular Cellular Biol.</u> , 11(3):1566-1577 (1991).
171	THUKRAL et al., "Alanine scanning site-directed mutagenesis of the zinc fingers of transcription factor ADRI: Residues that contact DNA and that transactivate," <u>PNAS</u> , 88:9188-9192 (1991), + correction page.
172	THUKRAL et al., "Mutations in the Zinc Fingers of ADRI That Change the Specificity of DNA Binding and Transactivation," <u>Mol. Cell Biol.</u> , 12(6):2784-2792 (1992)

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173	VORTKAMP et al., "Identification of Optimized Target Sequences for the GLI3 Zinc Finger Protein," <u>DNA Cell Biol.</u> , 14(7):629-634 (1995).
174	WEBSTER et al., "Conversion of the E1A Cys4 zinc finger to a nonfunctional His2, Cys2 zinc finger by a single point mutation," <u>PNAS</u> , 88:9989-9993 (1991).
175	WHYATT et al., "The two zinc finger-like domains of GATA-1 have different DNA binding specificities," <u>EMBO J.</u> , 12(13):4993-5005 (1993).
176	WILSON et al., "In Vivo Mutational analysis of the NGFI-A Zinc Fingers*," <u>J. Biol. Chem.</u> , 267(6):3718-3724 (92).
177	WITZGALL et al., "The Kruppel-associated box-A (KRAB-A) domain of zinc finger proteins mediates transcriptional repression," <u>PNAS</u> , 91:4514-4518 (1994).
178	WRIGHT et al., "Expression of a Zinc Finger Gene in HTLV-I- and HTLV-II-transformed Cells," <u>Science</u> , 248:588-591 (1990).
179	WU et al., "Building zinc fingers by selection: Toward a therapeutic application," <u>PNAS</u> , 92:344-348 (1995).
180	YANG et al., "Surface plasmon resonance based kinetic studies of zinc finger-DNA interactions," <u>J. Immunol. Methods</u> , 183:175-182 (1995).
181	YU et al., "A hairpin ribozyme inhibits expression of diverse strains of human immunodeficiency virus type 1," <u>PNAS</u> , 90:6340-6344 (1993).

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